

Subject Code: 1ET4030501	Subject Title: ELECTRICAL WIRING, ESTIMATING, COSTING AND CONTRACTING
Pre-Requisite	--

RATIONALE:

Electrical wiring plays a major role in distributing the electrical energy from electric utilities to consumer. Electrical diploma holders have to work as technicians and Supervisors for planning, installing and testing various electrical wiring Installations such as residential, commercial and Industrial electrification schemes. They should be able to prepare costing and estimates for these schemes with a thorough understanding of the methods/procedure of estimating, tendering/ contracting are desired. Knowledge of IE rules for different types of electrical Installation, their planning considerations equips the students with the capability to plan and prepare different Installation projects. Essential efforts are made in this course to develop above skills in the students

COURSE OBJECTIVE:

1. Understand about the Wiring systems & Electricity rules
2. Understand about the Electric circuit & Power circuit
3. Understand about How to calculate Sub circuits for Domestic appliances
4. Understand about Overhead service connection & Underground service
5. Estimating & Costing of Industrial Installations
6. Estimating & Costing of Domestic Installations
7. Understand about S.O.R.(Schedule of Rates)
8. Understand about Tendering Process for Electrification
10. Estimating & Costing of Transmission & Distribution line
11. Estimating & Costing of Repairs & Maintenance of Electrical Devices.

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment
04	00	02	05	60	40	20	30

DETAILS OF COURSE CONTENTS:

Sr. No	Topic and Subtopic	Total Hours	Weightage %
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1	Electrical Wiring and IE Rules Types of wires, wiring system, Specifications of Different types of wiring materials, Accessories, Wiring tools, Wiring circuits, Domestic and industrial panel wiring, I.E. rules for wiring, IE Act-2003, Differentiate between different types of wiring system, Troubleshoot different types of wiring circuits	07	15
2	Estimating, Costing and Contracting Estimation and estimation tools, Electrical Schedule of rates, catalogues, Survey and source selection, Recording estimates, Quantity and cost of material required, Purchase system, Purchase enquiry and selection of appropriate purchase mode, Comparative statement, Purchase orders, Payment of bills, Types of contract system, Tendering procedure and preparation of simple tender, Earnest Money Deposit, Security Deposit, Schedule of rates (S.O.R.)	09	18
3	Estimating and Costing of Domestic and Industrial Wiring Layout for domestic Wiring, Load calculation, Cable selection, Earthing, Selection of switchgear, Overall Estimating and costing, Layout for domestic Wiring, Load calculation, Cable selection, Selection of switchgear, Overall Estimating and costing, Calculate the Load, quantity and cost of material required for industrial wiring, Prepare Layout and wiring diagram for industrial wiring, Calculate the Load, quantity and cost of material required for domestic wiring	14	22
4	Estimation of Overhead Transmission Line, and Underground Distribution System Transmission lines, Line supports, Factors governing height of pole, Conductor materials, size of conductor for overhead, Transmission line: cross arms, pole brackets and clamps, guys and stays,	18	30

	conductors configuration spacing and clearances, span lengths, overhead line insulators, insulator materials lightning arrestors, erection of supports, setting of stays, Earthing of lines, Guarding of overhead lines, Clearances of conductor from ground, Spacing between supports conductors, I.E. rules pertaining to LV Transmission lines Describe Method of installation of service connection(1-phase and 3-phase), observing I.E. rules Overhead distribution system, Materials and accessories required for the overhead distribution system, Estimate for 440 V, 3-phase, 4 wires or 3 wires overhead distribution system, Types of service connections, Method of installation of service connection(1-phase and 3-phase), I.E. rules pertaining to overhead lines and service connection Underground distribution system. Materials and accessories required for underground distribution system, Estimate for 440 V, 3-phase, 4 wires or 3 wires underground distribution system, I.E. rules pertaining to underground system and service connection		
5	Estimating and Costing of Repairs and Maintenance of Electrical Devices and Equipment D.O.L. starter, small motor, mono block pump, automatic electric iron, table/ceiling fan, ICDP/ICTP Switch, etc. , Preparation of detailed drawing work of the product, Preparation of material quantity sheet for the product, Materials and cost required for maintenance work, Estimation of repairing cost and overall cost, Tools used for repairs & maintenance work Preparation of cost schedule for repair and maintenance of electric fan, automatic electric iron, single phase transformer, mixer grinder, D.O.L. Starter	08	15

COURSE OUTCOME:

After successful completion of the course, student will be able to

- Know about different types of wiring & tools.
- Know about Domestic wiring & Industrial wiring Estimation & Related I.E. rules
- Know about Service connections Estimation & Related I.E. Rules
- Know about Estimation & Costing for Maintenance of Different Electrical Products
- Understand about the procedure of Tendering in detail.

LIST OF PRACTICAL:

SR NO	PRACTICALS/EXPERIMENTS
1	Undertake following wirings a. Tube light wiring b. Stair case wiring c. Go down wiring d. Parallel loop wiring.
2	Select appropriate wiring and list materials and accessories for given project
3	Prepare cost estimate of a domestic installation cost (Residential building, laboratory room or Drawing hall etc).
4	Prepare cost estimate of an industrial installation. (Workshop, agriculture, flour mill, etc.)
5	Prepare cost estimate of an overhead service connection. (Single phase and three phase).
6	Prepare cost estimate of an underground service connection (single phase and three phase).
7	Estimating & Costing of Over Head 440V, 3 phases, 4 or 3 wire Distribution Line.
8	Estimate of material and specifications required for 220kV/110kV Transmission line.
9	Estimate of material and specifications of any one Electrical Product
10	Estimating and Costing of Repairs & Maintenance of any one domestic appliances.
11	Prepare a tender notice for given project work

LIST OF REFERENCES:

Sr No.	Title of Book	Author	Publication
1	Electrical Design, estimating & Costing	Raina, K. B. and Bhattacharya, S.K.	New Age International (p) Limited, New Delhi
2	Electrical Estimating & costing	Uppal, S L	New Age International (p) Limited, New Delhi

3	Electrical Installation Estimating & Costing	Gupta, J.B.	S. K. Kataria & Sons, New Delhi
4	I.E. rules for wiring, Electricity supply act-1948	Bureau of Indian Standards	Electricity supply act-1948